

CHINESE CENTRAL MONETARY POLICY
AND YUNNAN COPPER MINING
DURING THE EARLY QING
(1644–1800)

Thesis

presented to the Faculty of Arts
of
the University of Zurich
for the degree of
Doctor of Philosophy

by
HANS ULRICH VOGEL
of Basel

Accepted on the Recommendation of
Professor R.P. Kramers Ph. D.

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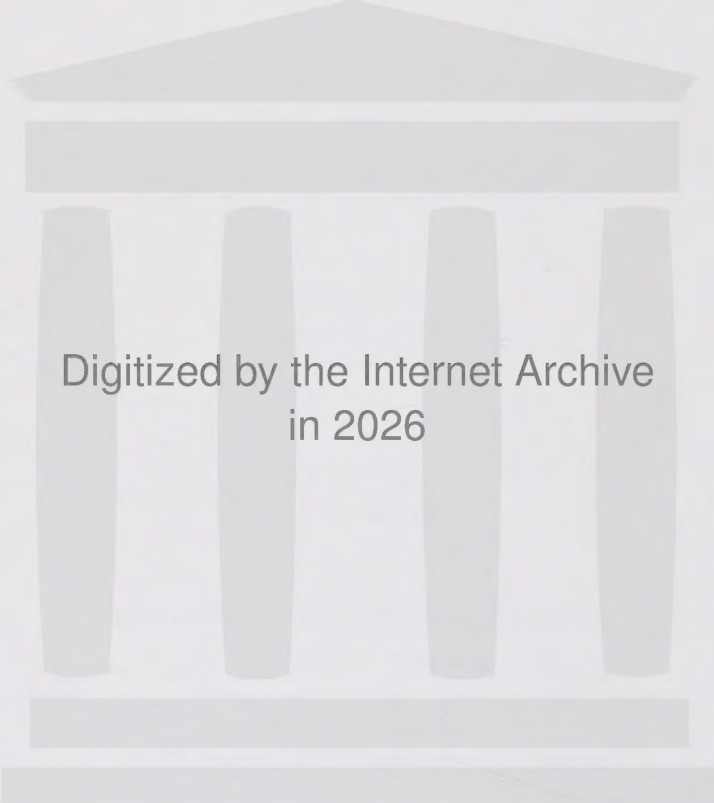
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Weights and measures

Weights and measures used in official documents are usually standard weights and measures. See also Chuan Han-sheng (2), pp. 13 ff.

Weights

1 <u>dan</u> (picul)	= 100 <u>jin</u>	= 59.7 kg
1 <u>jin</u> (catty)	= 16 <u>liang</u>	= 596.993 g
1 <u>liang</u> (ounce)	= 10 <u>qian</u>	= 37.312 g
1 <u>qian</u> (mace)	= 10 <u>fen</u>	= 3.731 g
1 <u>fen</u> (candareen)	= 10 <u>li</u>	= 0.373 g
1 <u>shi</u>	= 4 <u>jun</u>	
1 <u>jun</u>	= 30 <u>jin</u>	

Linear measures

1 <u>li</u> (chin. mile)	= 180 <u>zhang</u>	= 576 m
1 <u>zhang</u>	= 2 <u>bu</u>	= 3.2 m
1 <u>zhang</u>	= 10 <u>chi</u>	= 3.2 m
1 <u>chi</u>	= 10 <u>cun</u>	= 0.32 m
1 <u>cun</u>	= 10 <u>fen</u>	= 0.032 m

Volume measures

1 <u>shi</u>	= 2 <u>hu</u>	= 103.5 liters
2 <u>hu</u>	= 10 <u>dou</u>	= 103.5 liters
1 <u>dou</u>	= 10 <u>sheng</u>	= 10.35 liters
1 <u>sheng</u>	= 10 <u>ge</u>	= 1.035 liters

Monetary terms and units of account

Silver sector

1 tael	= 10 <u>qian</u>	= for the standard <u>kuping</u> tael of the Qing: 37.31256 g silver of 1,000 fine
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In Qing accounts fractions of the basic fiscal unit "tael" are enumerated by name, like qian, fen, li, and so on. For the sake of clarity only "tael" is used in this book, fractions being indicated by the decimal point.

Cash sector

1 string	= 1,000 cash
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This pertains to the cash output figures of the mints. One string actually consisted of 1,000 standard cash coins. However, according to three different regional unit of account systems, one string could comprise either 1,000, 500 or 160 coins, or often fewer than 1,000, 500 or 160 coins, depending on the local conditions. In these cases not the physical aspect of a string was meant, but its function as a unit of account. See King (1), pp. 58 ff., 244.

Official exchange rate of cash coins to silver

1,000 standard cash coins : 1 standard tael silver

This was the official exchange rate as it prevailed in the early Qing, though adaptations occurred. The market exchange rate which was adopted in private transactions was seldom in accordance with the officially fixed rate and fluctuated. "The exchange rate of copper cash was high" means that there were more than 1,000

coins exchanged for one tael silver, therefore "the value of cash was low". "The exchange rate of copper cash was low", on the other hand, means that there were less than 1,000 coins exchanged for one tael silver, therefore "the value of cash was high". When speaking of a "high" or "low exchange rate", this always refers to cash.

Monetary terms

Zhiqian, standard cash: cash manufactured according to the official regulations on weight, alloy, size, and legend. This term contrasted with siqian (counterfeit).

Daqian, large cash: Used before 1850 for standard cash of a weight of more than 1.2 mace, in contrast to xiaoqian (small cash), being either counterfeit or small cash of the Kangxi period (1662-1722) of 1 mace or less.

Mao, casting period: Name of the period during which the furnaces of a mint were in operation. At the same time mao also meant a quota of mint metal to be consumed and of cash to be cast. In the Qing period, mao was used for the first time presumably in the Yunnan mints in 1659. The amount of cash to be cast during one casting period varied greatly from mint to mint. Sometimes, during one mao as much as 120,000 catties of mint metal were consumed, in other cases only 1,000 catties. The term mao was also ambiguous as it stood either for the whole mint or for the operation of single furnaces. For instance, the minting activities of the Hunan mint were divided into 36 casting periods per annum, each of the 15 furnaces beginning and stopping to cast at a certain point of time. From the point of view of the mint in its entirety the number of casting periods thus amounted to 36. On the other hand, also the operation of a single furnace was divided into 36 casting periods. Thus, from the point of view of the furnaces there were annually $15 \times 36 = 540$ mao. The latter method of accounting was particularly helpful and necessary when expressing the productivity of single furnaces. In the beginning of the Qing other terms like cheng or bao existed as mint productivity units. See Hunan tongzhi, III, 1395-96; QDDA, pp. 161 ff.; QCWXTK, pp. 4965c-4966; Burger (1), p. 13 f.

Abbreviations

Works and collections cited only by alphabetical abbreviations

DNKCTL	<u>Diannan kuangchang tulüe.</u>
DQLLHTXZ	<u>DaQing lüli huitong xinzuan.</u>
DQSC	<u>DaQing shichao shengxun.</u>
DX	<u>Dianxi.</u>
EC	<u>A.W. Hummel, Eminent Chinese of the Ch'ing Period.</u>
GBZL	<u>Qinding gongbu zeli.</u>
GCQXLZ	<u>Guochao qixian leizheng.</u>
GX-HDSL	<u>Qinding DaQing huidian shili, Guangxu ed.</u>
GZDKX	<u>Gongzhongdang Kangxichao zouzhe.</u>
GZDQL	<u>Gongzhongdang Qianlongchao zouzhe.</u>
GZDYZ	<u>Gongzhongdang Yongzhengchao zouzhe.</u>
HBSZL	<u>Zhongguo jindai huobishi ziliao.</u>
HBZL	<u>Qinding hubu zeli.</u>
HCJSWB	<u>Huangchao jingshi wenbian.</u>
HCZDLZ	<u>Huangchao zhengdian leizuan.</u>
HCZGHB	<u>Huangchao zhanggu huibian.</u>
HQZY	<u>HuangQing zouyi.</u>
JDZGSLCK	<u>Jindai Zhongguo shiliao congkan ed.</u>
JDZGSLCKXB	<u>Jindai Zhongguo shiliao congkan xubian ed.</u>
JQ-HD	<u>Qinding DaQing huidian, Jiaqing ed.</u>
JQ-HDSL	<u>Qinding DaQing huidian shili, Jiaqing ed.</u>
KZJL	<u>Kuangzheng jilüe.</u>
MHDLZ	<u>ManHan dachen liezhuan.</u>
QCTD	<u>Qingchao tongdian.</u>
QCTZ	<u>Qingchao tongzhi.</u>
QCWXTK	<u>Qingchao wenxian tongkao.</u>
QCXWXTK	<u>Qingchao xuwenxian tongkao.</u>
QDDA	<u>Qingdai dang'an shiliao congbian, vol. VII.</u>
QDKY	<u>Qingdai de kuangye.</u>
QDQBMRZ	<u>Qingdai qibai mingren zhuan.</u>
QHS	<u>QianHan shu, 1739 ed.</u>
QS	<u>Qingshi.</u>
QSG	<u>Qingshiqao.</u>
QSL	<u>DaQing lichao shilu.</u>
QSLJJZLJY	<u>Qingshilu jingji ziliao jiyao.</u>
QSLZ	<u>Qingshi liezhuan.</u>
SGYSZL	<u>Zhongguo jindai shougongyeshi ziliao.</u>
SQYJ	<u>Shiqu yuji.</u>
TGKW	<u>Tiangong kaiwu.</u>
TZBL	<u>Tongzheng bianlan.</u>
XYNTZG	<u>Xu Yunnan tongzhigao, 1901 ed.</u>
YNBZZ	<u>Yunnan beizheng zhi.</u>
Yntz	<u>Yunnan tongzhi (On the copper of Yunnan).</u>
YNTZG	<u>Yunnan tongzhigao, 1835 ed.</u>
YZZPYZ	<u>Yongzheng zhupi yuzhe.</u>
ZGBJCS	<u>Zhongguo bianjiang congshu.</u>
ZGFZCS	<u>Zhongguo fangzhi congshu.</u>
ZGSZHB	<u>Zhongguo shengzhi huibian.</u>

Modern reprints of Qing primary sources frequently have new page numbers as well as the old Chinese ones. As these reprints are widely available, only the new page numbers are used. For other source materials, the original chapter and pagination are cited, a standing for the first and b for the second half of double pages.

Where there are three horizontal columns, a, b, and c are respectively used.

As the YZZPYZ was only for a short time at my disposal, references to it are not uniform. I cite the new pagination in cases when I consulted this work myself. If quoted from other sources, I follow the original author's quotations.

Reign periods

SZ	Shunzhi	1644-1661	DG	Daoguang	1821-1850
KX	Kangxi	1662-1722	XF	Xianfeng	1851-1861
YZ	Yongzheng	1723-1735	TZ	Tongzhi	1862-1874
QL	Qianlong	1736-1795	GX	Guangxu	1875-1908
JQ	Jiaqing	1796-1820	XT	Xuantong	1909-1911

Other abbreviations and diacritical marks

mem.	=	memorial
imp. e.	=	imperial edict
imp. end.	=	imperial endorsement
GG. Sichuan	=	governor-general of Sichuan
G. Hubei	=	governor of Hubei
Fin. Comm.	=	financial commissioner
*	=	intercalary month (e.g. YZ 2/4*/12) or year with an intercalary month (e.g. YZ 2*)

VI Conclusions

A characteristic of the early Qing monetary system was the contradictory situation in which the central monetary policy only addressed problems related to the copper currency in spite of the fact that silver constituted the main revenue delivered by the localities to the central government.¹ The Qing monetary institutions left private merchants to handle the supply of silver, as well as the casting of silver bullion and the management of silver foundries. Only after the drainage of silver from China due to opium imports became evident in the 1810s did the state begin to concern itself with silver. Even when the Qing central government did intervene, this was only because the silver drainage made it increasingly difficult for the peasants to fulfill their tax obligations.²

During the early Qing, central monetary policy concentrated on the copper cash currency. Though from the fiscal point of view minting was frequently unprofitable, the Qing's monetary policy was nonetheless very active for ideological, economical, and political reasons. The principal beneficiaries were intended to be peasants and soldiers. It was a common introductory sentence in memorials and edicts that minting and monetary policy were undertaken for the benefit of the common people, who needed plenty of cash coins in their daily transactions.³ In evaluating the monetary policy three types of activity on the side of the monetary authority may be identified: (1) administration of existing regulations, (2) the execution of minor changes, and (3) the undertaking of major reforms when necessary.⁴ The present study was only concerned with the first two, as up to the end of the 18th century the monetary system worked quite well and there was no necessity to undertake major reform. Cash in fact appears to have been highly appreciated

and was a store of relatively high value during most years of the early Qing. For instance, in 1743 the governor of Fujian reported that people even used cash for wedding presents or for house purchases.⁵ Irreversible depreciation of the copper currency did not set in until the beginning of the 19th century. As one economic historian observed, the late Qing government then failed to carry out a thorough reform in the copper cash and silver sectors.⁶

To the first level, that of the administration of existing regulations, belonged the actual running of the mints. This task comprised organization, supervision, and management, all aimed at ensuring the quality of a given coinage and the prevention of counterfeiting by mint officials and personnel.⁷ Another duty was the fulfillment of stipulated mint metal procurement and cash output quotas. Also, to various local, regional and provincial officials fell the enforcement of prohibitions with relation to counterfeiting, illegal melting down, cornering, hoarding, and large-scale exportation of cash. Another task at this level was the maintenance of a reasonable market exchange rate as well as purification of the cash coin sector through the collection of old and counterfeit cash.

At the second level, the record shows that minor changes were frequently undertaken in response to the inherent fluctuations of the monetary system.⁸ For example, at the cash coin production level, the weight and alloy of the cash were often adjusted. This measure aimed to reconcile the intrinsic and face values of the coin. As examples of further minor changes we may mention that the government influenced the amount of circulating cash by increasing or decreasing of mint output, as well as by augmenting or diminishing cash payments of military rations, officials' salaries, and other public expenses. Official interregional cash shipments

were an additional means. In times of cash shortage, cash accumulation in official treasuries, principally of cash derived from official grain sales, was avoided. Incoming cash was rapidly put back into circulation. In times of cash oversupply, the government endeavoured to accept an increased amount of cash in tax and duty collections. Besides attempts at enforcing compulsory use of cash and silver in official and private transactions, control was also exerted over the cash stocks of pawn shops. Finally, when market and official exchange rates differed widely, the official exchange rate was adjusted to make it more realistic.⁷

The implementation of these minor changes shows us the monetary concepts officials had in mind. They demonstrate that the responsible officials usually understood well the mechanisms and fluctuations in the monetary system. Although there was no body of generally accepted theory, empirical statements expressing the views of officials about specific situations are numerous. For example, brass prohibitions were based on the realization that the manufacture of brass utensils could force up the value of cash. Especially at times when the supply of copper cash was scarce, this could hurt the monetary system and the economy. One official put it as follows: "Copper is just not yet cast cash, whereas cash is just already cast copper. If one is expensive, then also the other is expensive, and if one is cheap then also the other is cheap."¹⁰ Adjustments in the cash alloy and cash weight were undertaken to reconcile the intrinsic value with the face value.¹¹ Officials recognized that the quantity of cash in circulation affected the cash value.¹² It was noted that if silver was scarce, its value rose and that the market exchange rate between copper and silver also was affected. Furthermore, officials noticed that fluctuations in cash or silver value affected prices.¹³

Of course, officials also sometimes failed in their assessment of money and price fluctuations. For instance, in 1745 one official ascribed rising grain prices to the population increase and the augmented grain demand.¹⁴ He did not take into account the large influx of foreign silver which was mainly responsible for this inflationary trend.¹⁵ In 1749 the Qianlong Emperor held that the value of cash was also influenced by the harvest. If the harvest was good, grain prices would sink and with them the value of cash.¹⁶ In the 1840s the theory was advanced that at that time of silver scarcity a (depreciated) copper currency should partly replace silver in official transactions. This proved unrealistic.¹⁷ Another misconception was to think that new cast cash of good quality would drive ill-manufactured and counterfeit coins out of circulation.¹⁸ In times of a high cash value, such good coins immediately disappeared into the melting pot.

When appraising early Qing monetary policy, both successes and failures can be registered. The monetary institutions of the early Qing were no more successful than those of earlier times at preventing the counterfeiting, illegal melting down, cornering, hoarding, and illicit exportation of cash. They adopted the time sanctioned regulations concerning alloy and weight of cash coins, collection of old and bad cash, circulation of cash, and compulsory application of different media of exchange in transactions. The early Qing dynasty did, on the other hand, distinguish itself from former ones by its success in securing and maintaining a relatively constant metal supply for the mints. Consequently, it was able to make the cash output keep pace with the increase in population and the expansion of the economy. A more uniform cash situation was the result.¹⁹ Learning its lesson from the experiences of former dynasties, the early Qing was better able to stabilize its monetary

system by renouncing cash of larger denominations and other kinds of media of exchange.

Furthermore, although the early Qing had its own brass prohibitions and rounding up of brass utensils to feed the mints, copper penury, coercive collections of brass and copper utensils, and copper export prohibitions had been more prevalent in earlier dynasties.²⁰ If the early Qing had failed to solve the mint metal supply problems, it probably would have been compelled at an early date to undertake a thorough reform of the monetary system with uncertain results. Consequently, as the early Qing government had successfully concentrated all its efforts on building up an efficient mint metal supply system, little motivation for deviation from well-established methods and for profound reform of the monetary system existed when the almost irresistible depreciation of the copper currency set in towards 1835. In any case, profound reform would have meant a radical departure from many traditional policies.

The above described measures dealt with cash production and circulation. But, the most important aspect of monetary policy pertained to the procurement of copper, the most important mint metal. Copper came from various places. With the exception of local shortages, mint metal was relatively abundant in the beginning of the Qing. A first general mint metal crisis occurred towards 1673, but with the large-scale importation of Japanese copper from 1683 on the supply difficulties were solved. The Chinese mints became wholly dependent on Japanese copper during the following 40 years. During this time, China also became increasingly dependent on imports of silver, its second medium of exchange. A side effect of these imports of copper and silver was that China became intensively linked to international trade.

Against this background, a second and more serious copper crisis set in around 1715 with the limitation of Japanese copper exports and with the growing demand for copper cash. This crisis dangerously drove up the value of the copper coins. Most spectacular and symptomatic of this crisis, but largely ineffective, were the brass prohibitions subsequently pronounced. They were finally abolished in 1736. Yunnan copper increasingly began to substitute for Japanese copper, although at first only hesitatingly so because of qualitative shortcomings and transport difficulties. Only because of the Japanese copper shortage did the Yunnan copper mines gain more substantial support from the central authorities. Likewise, the periods of copper shortage were also times when copper mining was generally promoted. From 1738 the central mints were wholly supplied with the abundant and relatively cheap Yunnan copper, as were to a large extent provincial mints. Japanese copper, copper from other provincial mines, and privately traded copper supplemented Yunnan copper in fulfillment of the quotas of the provincial mints.

The importance of Yunnan copper mining can be discerned from a comparison with western output figures: In 1800 "world production" of copper amounted to 10,000 tons.²¹ During the peak years from 1737-ca. 1810, Yunnan produced approximately 6,000 tons a year. In 1764, the absolute peak of productivity of 9,000 metric tons was achieved. These figures were unequalled in China until recently when the PRC reached an output of 10,000 metric tons nationwide in 1952 and 200,000 metric tons nationwide in 1975.²² When a revival of the Yunnan mines was attempted in 1862, only an output of 300-600 metric tons could be reached.²³ In the republican era, a mere 800-2,000 metric tons proved feasible in Yunnan.²⁴ These days,

only the Dongchuan and Gejiu mines in Yunnan are still of any economic significance.²⁵

State involvement in Yunnan copper mining was most evident in investment and copper purchase monopoly. The price of copper, which was officially fixed, was usually paid to the miners in advance. In return, the miners had to deliver their copper to the officials. Frequently, however, the official price was too low in relation to production costs, so that the Yunnan miners and smelters suffered losses. In spite of tax decreases and copper price increases, mining debts resulted. In order to ensure the copper supply, the government had to deal with the mining debts. The making good of debts was accomplished either by means of deductions from the state copper price, compulsory redemption by officials or smelters, drawing on minting profit silver and copper administration proceeds, or sometimes by imperial remittances. Prevention of mining debts was also attempted by pure administrative measures, such as closer supervision of the accounts of mining officials. These measures were of limited success, however, and so the officials had to provide credits and special funds for drainage. Eventually, officials had also to provide rice, oil, and charcoal and the state had to relax its copper purchase monopoly in order to improve the financial situation of the miners and smelters.

The relationship between mining and minting was particularly close in Yunnan. The Yunnan mints were not only substantial copper consumers but also suppliers of additional mining funds. Besides the copper administration profits, the Yunnan minting profits became an important means of compensating for the losses of the Yunnan mines. Increasingly, proceeds from both were used to finance copper price increases, redeem outstanding debts, buy grain for

miners, and maintain the transport system. At times these profits were employed to grant credits, finance the salvaging of copper cargos in shipwrecks, or compensate for shortcomings in the quality of copper delivered to Peking. Apparently, the general principle was to shift from the investment of central funds to that of provincial funds.

The development of the official transportation system was basic to the prosperity of the Yunnan copper mining industry. For this purpose new transport routes were opened and repaired, waterways dredged, and transport organized. Most difficult for copper transportation were the recurrent shortages of pack-animals in Yunnan and the dangerous stretch of the Yangtze river in Sichuan and Hubei. In addition to other natural obstacles like storms, high waters, shallows and rapids, abuses and violations of the regulations impeded the delivery of copper to the mints.

Moreover, copper mining and transport were also important for the development of Yunnan province during the latter half of the early Qing. Not only was the position of the province's financial administration improved by the proceeds from the copper administration and the minting industry, but the booming mining industry attracted immigrants from Jiangxi, Hubei, Hunan, Guangdong, Guangxi, Shanxi, Shenxi, Guizhou, and Sichuan, resulting in population growth and promotion of trade and industry.²⁶ At the Tangdan mine alone 200,000-300,000 miners are said to have found occupation around 1764.²⁷

The achievements in copper procurement and monetary policy contributed without doubt to the "Golden Age"²⁸ of the Qing from 1662-1795. While the Kangxi period (1662-1722) was characterized by a dependence on Japanese copper imports, the Yongzheng period (1723-1735) was a period of innovation in the political,

administrative, fiscal, and ideological fields,²⁹ during which the foundations were laid for the ascension of the Yunnan copper mining industry and the subsequent stabilization of the copper currency. During the Qianlong reign (1736-1795) regimentation and institutionalization of all fields connected with the Yunnan copper administration took place. This period profited most from the flourishing of the Yunnan copper mining industry and its positive effect on the monetary system.

While, in the beginning, Yunnan copper was important for the upkeep of the monetary system, its abundance ultimately fueled the depreciation of the copper currency in the early 19th century, although rapid rises in the value of silver, due to drainage, also contributed to this crisis. Particularly the Daoguang period (1821-1850) was affected by the negative consequences of an oversupply of copper and a depreciated copper currency. The effects of this monetary crisis on the economic, social, and political development of China must not be underestimated.

The Role of Qing Bureaucracy

The Qing bureaucracy was naturally deeply involved in the administration of monetary institutions and copper procurement. While monetary policy belonged to the traditional routine duties of officials, Japanese copper procurement and Yunnan copper affairs posed special problems. Because of the different nature of their administration, these fields will be dealt with separately.

The administration of the mints was under the control of the central bureaucracy. The Board of Revenue and the Board of Works directly managed only the two mints in the capital, but in the end, these two boards had the final word on the running, cash output, and use of minting profits of the various provincial mints, whose

day to day affairs were taken care of by local and regional officials. The weight and alloy of all cash produced in the empire were also fixed in Peking. The Qing monetary organization was not excluded from normal administrative procedure, so that all officials could voice their ideas through the memorial system. This usually included the governors, governors-general, financial commissioners, censors, grand councillors, and the presidents of the Board of Revenue and the Board of Works. But military officials memorialized, too, particularly with regard to military rations and abuses. Reports of low ranking officials frequently found their way into the memorials of their superiors. Monetary affairs involved the same five kinds of offices as in any organizational complex of the Qing bureaucracy: executive offices, supervisory offices, advisory offices, coordinating offices, and client offices.³⁰

Although monetary affairs were decided by the central bureaucracy and in the final analysis by the emperor, provincial authorities were granted much autonomy in running the mints under their jurisdiction. As was customary in Qing administrative procedure, the provincial authorities were obliged to send in periodical reports and accounts, focusing in practice on minting profits,³¹ to the Board of Revenue, which in effect was mostly a supervisory office and did not pay much attention to nationwide mint statistics. The degree of provincial autonomy also becomes clear in the monetary discussions of 1744-1745, when provincial authorities had an important advisory function. They were asked to investigate the practicability of E'ertai's eight proposals for monetary adjustments in their provinces.³² Such consultation was necessary because standardization and uniformity could not be enforced; thus, local and temporal conditions differed and required flexibility (yindi zhiyi, suishi biantong).³³

Because of its importance for coinage, early mint metal and copper procurement fell from the beginning under more or less strict official supervision. The procurement of copper and the provision of funds became the duty of such disparate administrative offices as the native and maritime customs, salt administrations, offices for the taxation of reclaimed land, districts, departments, provinces, and various Boards. At the ground level, provincial, regional, or local officials and underlings were entrusted with the procurement of copper and its transport to Peking. Adjustments and the relative flexibility of the organizational scheme and the regulations governing them, as well as the quotas reflected changes in the copper supply sources and they are reliable indicators of the copper supply conditions.

Another characteristic of the early copper procurement system was the high degree of cooperation with merchants since they had to transport the copper to the copper procuring agencies whence it was further conveyed to Peking under government management. In the period of Japanese copper importation, state-licensed merchants carried out the maritime trade. Merchants with a special relationship to the central government and the emperor were entrusted with the directly or indirectly profitable copper trade. For instance, in the period from 1700-1715, merchants even took over the direct management of mint metal procurement and transport to Peking. The function of the various administrative offices was then limited to the provision of the required mint metal funds. Therefore, the mint metal and copper procurement organizations before 1736 may be considered examples of cooperative arrangements between the state and merchants.³⁴

The transition from Japanese to Yunnan copper brought with it profound organizational changes. The Yunnan copper mines were

mostly run by small-scale entrepreneurs under government supervision, which was another instance of cooperation between officials and merchants. But the participation of merchants in the copper trade was considerably limited. The merchants' share in copper trade remained limited to the import of small amounts of Japanese. The copper transport from Yunnan to Peking was, however, completely directed by officials. Nonetheless, during the overland and water transport, officials also depended on the assistance of transport firms to provide pack-animals, ships, and personnel.

The importance of copper mining for Yunnan and the whole empire was reflected in the administration of the mining and transport organization, for which even a new term was created (tongzheng). However, as in the period of Japanese copper importation, no special administrative organizations were created for this purpose; rather, copper administration became the concurrent duty of the local, regional, and provincial officials. Copper administration therefore exhibited the general characteristics of Qing administration and economic organization. Similar to the salt administration and land taxation, the state tried to carry out a kind of planned economy by setting up production and taxation quotas. Unlike land taxation, however, the mines' output was irregular and necessitated frequent adjustments in the production and taxation quotas. With regard to the mining and transport officials, the usual procedures of recommendation, appointment, and guaranteeing were followed. Standard regulations were followed regarding the scope of administrative duties of the various officials concerned, as well as mutual control and shared responsibility by different administrative levels, establishment of time-limits, and exact accounting. Punishments and rewards were used to elicit efficiency and obedience and to restrict abuses to a

tolerable level. Problems were flexibly dealt with, particularly in the financial domain, where local and central funds were usually skilfully allotted.

The Yunnan copper administration was gradually incorporated into the regular administrative system. This meant that regular officials from the district magistrate upwards were entrusted with copper mining and transport organization and that petty officials were barred from responsible posts. As officials were, however, constantly confronted with problems of mining, smelting, and transport, a tendency towards professionalization and specialization of officials is recognizable. This trend is also noticeable in other complex organizational undertakings of the Qing state.³³ The main duties of the responsible officials involved securing the copper supply for the mints, collecting mining taxes in silver and tax copper, issuing state funds to the miners, maintaining law and order, transporting copper, and other tasks connected with mining and smelting. Copper administration was an important duty for most local, regional, and provincial officials in Yunnan. Many of them encountered serious difficulties due to mismanagement, abuses, or simply the gradual exhaustion of the mines.

In conclusion, the Yunnan copper administration demonstrates the working of the Qing imperial bureaucracy and serves as an example for the organizational capability of the state in the monetary field. It was the consistent effectiveness of the government administration of copper mining and transport, rather than - as has been assumed³⁴ - its prolonged malfunctioning, which was a major factor in bringing about the monetary crisis towards 1850.

The Decline of the Yunnan Copper Mines

Various factors in interaction resulted in the decline of Yunnan copper mining. Roughly speaking, we may discern monetary, technical, political, social, financial, and economic causes. One important reason was the close connection between the mines and the monetary system. When the Qing monetary system began to disintegrate in the early 19th century and the copper demand of the mints declined, the mines naturally were deeply affected. Copper administration lost in importance. Ironically, the depreciation of the copper currency had been fuelled by the very productivity of the Yunnan mines. The government failed to respond properly, as it tried to keep up the production levels in Yunnan, instead of controlling the market price of copper and the value of cash by closing the faucet.

Aside from the monetary crisis, a deterioration in the technical circumstances of copper production towards 1850 seems to have sped the decline of the mines in Yunnan. From the very beginning, complaints of depletion of the ore and technical difficulties often accompanied reports,³⁷ but towards 1850 more and more memorials stated that shafts had grown unworkably deep, that serious inundations had become frequent, and that ore had become scarcer. The surrounding hills had by this time also been deforested, so that the charcoal for the smelting process was difficult to obtain. Consequently, the discrepancy between production costs and the fixed prices of the state, the principal buyer, only grew.³⁸ The decline in the amount and quality of Yunnan copper came to constitute a serious problem. The decline in quality alone would have been enough to worsen the situation as the Peking mints had to demand even larger shipments in compensation. In view of the fact that, following the Muslim rebellion (1855-1873), the

production of the mines could not come close to equal earlier records, despite the use of modern machinery and mining methods, the conclusion seems fair that one reason for the decline of the mines was the exhaustion of copper deposits.³⁹

Recurrent curtailments in the state mining and transportation funds due to external and internal wars constituted a heavy blow to the Yunnan copper mining industry. For example, during the First Opium War (1839-1842) and during the Taiping rebellion (1850-1864), funds earmarked for use in Yunnan copper mining and transportation were employed to defray military expenses.⁴⁰ The general decline of the copper mines and the suspension of government funds caused hardships to the miners in Yunnan. Therefore, the Financial Commissioner Xu Youren ordered the copper of the mines to be used for cash casting. The cash was handed over to the miners in order to alleviate their distress.⁴¹

Doubtless, one important economic reason for the outbreak of the Muslim rebellion (1855-1873)⁴² was the distress in the mining industry. Already in 1817 and 1818 a rebellion of the Yi people in Lin'anfu had impaired the output of the Jinchai mine, resulting in deficits in the annual quota of 194,988 and 152,955 catties, respectively.⁴³ It is not coincidental that many bloody incidents occurred between Chinese and Muslims as well as between miners at such mines as Tangdan before the rebellion and that a dispute over a silver mine led to the outbreak.⁴⁴

At the level of copper mining itself, the financial situation of the copper mines deteriorated. Historians of the PRC have recently suggested that the "sprouts of capitalism" in Yunnan mining failed to blossom because of the inordinately low price of copper, held down by the government, and because of fraudulent and greedy officials and other members of the upper classes involved in

mining. They argue that, rather than the exhaustion of the mines themselves, the failure of native technology, or the impact of the West, state control and state purchase monopoly actually caused the withering of the sprouts of capitalism in the Chinese mining sector. They see the principal contradiction as existing between state-controlled mining and mining enterprises by private merchants.⁴⁵ Cai Yurong is presented as the great innovator of a systematic mining policy⁴⁶ and the promoter of Yunnan copper mining. It is alleged that in 1682 he ventured to foster mining by commoners against the opposition of all conservative officials. The establishment of the state copper purchase monopoly initiated in 1705 by Beihenuo, on the other hand, is regarded as having obstructed growth of Yunnan copper mining.⁴⁷

While it is true that the state did profit from the discrepancy between the official account prices and the actual prices paid to the miners, this has often been exaggerated. With this profit margin administrative expenses and transportation costs had to be covered; the remaining part was earmarked for various public expenses in Yunnan. Embezzlement by officials did occur, but in many cases it did not transgress the level which was considered customary and was publicly accepted. Sometimes mining also had to cope with conservative and radical proposals involving geomantical, for example, considerations or the attitude that, compared to agriculture, mining was an inferior occupation. However, since the Japanese copper supply was decreasing and the copper demand for coinage was growing, the government not only tolerated but even promoted mining, particularly of Yunnan copper and Guizhou zinc. The great achievements of the state were the establishment of the copper purchase monopoly and the transport system. The tremendous copper demand of the Chinese mints guaranteed a stable and constant

development of the copper mines, while, with the organization of the transport, the copper could be exported from Yunnan to the other provinces of the empire. Although the net copper price granted to the miners was too low, this study has demonstrated that the Yunnan provincial government raised different kinds of auxiliary funds and adopted other measures to compensate for this insufficiency. Sometimes, mining debts simply had to be remitted. Although no evidence exists that it was actually profitable for the miners, I can hardly imagine that Yunnan copper mining would have flourished for more than hundred years if costs of production had not been covered and no funds for reinvestments had been generated. Rather than having tried to hinder the growth of the mining industry, the early Qing government can actually claim substantial merit in its development.

Moreover, the establishment and elaboration of the state monopoly on the purchasing of copper suggests that private capital was insufficient to develop the Yunnan mines. In the period from 1682-1705, when it was permitted to mine and market copper privately in Yunnan, mines were opened by merchants (shangmin). But as large mines were beyond their means, it was the provincial authorities and regional officials who on their own initiative provided capital and entrusted their confidantes with the management of mining.⁴⁹ In the terminology of those days, miners were called "merchants", but in reality these were overwhelmingly common miners⁵⁰ and smelters with limited capital, if any at all. The small-scale "rice share" system (mifen) was a widespread and typical form of private investment in Yunnan mining. The ore was allotted proportionally to the amount of rice or capital invested.⁵⁰ After the establishment of Beihenuo's government copper agency, the governor-general engaged local people to undertake mining in

1713.⁵¹ Apparently, mining was then undertaken under official auspices. Around 1716 capital was issued by the provincial authorities to the government merchant Wang Risheng⁵² to undertake copper mining,⁵³ but merchants were no longer mentioned by name thereafter.

Records of substantial investments by rich merchants in Yunnan copper mining before 1850 are rare and seem to originate from the second half of the 19th century, when it was attempted to reactivate Yunnan copper mining by alluding to its former profitability and thus trying to attract private investors from Central China. For instance, the 1901 edition of the provincial gazetteer claims that, formerly, large amounts of capital had been invested and huge profits made by merchants from Jiangsu, Jiangxi, Anhui, Hunan, Hubei, Sichuan, and Guangdong.⁵⁴ Although, during a wave of immigration into Yunnan from 1700-1850, there were numerous immigrant merchants from Hunan and Jiangxi who virtually created an urban commercial class and are said to have monopolized all interprovincial trade and industry,⁵⁵ they seem not to have been involved in mining production. Likewise, it has been observed that capital was generally not short in China,⁵⁶ but investment of merchant capital in mining was, nevertheless, rare. Already in 1724 it was stressed that miners (dongmin) in Yunnan were not rich merchants, but mostly depend on state capital.⁵⁷ In 1740 Zhang Yunsui complained that no dealers from other provinces (kefan) were coming to undertake the marketing of Yunnan zinc and that smelters were not able to do this by themselves.⁵⁸ In 1815 a memorial states that the copper smelters (luhu) came from other provinces than Yunnan, and that they brought no capital along with them but wholly depended on the capital granted by the state.⁵⁹ Inadequate

investment by merchants in mining production is reported in other provinces, too, notably in Guangdong.⁴⁰

The general insufficiency of private investment in the mining sector has recently been recognized by historians in the PRC. They argue that high taxes as well as state exploitation prevented accumulation of private capital by merchants and miners, and that this inhibited larger private investments.⁴¹ Although the evidence is not yet complete, it seems to me that there existed specific reasons why merchants were not able to make a profit in the Yunnan mines. Usually, merchants cooperated, often profitably, with the government.⁴² Rather than the state monopoly, supervision, or high taxation, the remoteness of Yunnan and transport difficulties prohibited any more extensive involvement on the part of private merchants. Yunnan had few navigable waterways and pack-animals were often scarce. Transport organization and the opening of overland routes and waterways required large investments, exceeding the means of merchants. Based on the above arguments, it seems superficial to emphasize that there existed a contradiction between the policy of calling upon merchants to undertake mining and the state monopoly on copper purchase.

This study demonstrates that it was on account of the importance of copper for cash coinage that the state was heavily involved in copper procurement and mining. If copper had not been scarce, the Qing state would have probably limited its involvement to supervision and taxation. This would also suggest that the Yunnan mines do not represent a general attitude of the early Qing towards the economy because its involvement was an emergency policy and must be considered a response to monetary requirements and thus part and parcel of monetary policy. However, once the government was involved, it applied its well-established administrative

techniques derived from other economic or fiscal undertakings. Because of the decisive role of the state, it is questionable whether Yunnan copper mining can constitute a conclusive argument for the "sprouts of capitalism" theory. On the one hand, a free labor force existed which was remunerated either in kind or in money. There were also a few large and complex mining enterprises with great functional specialization and occupational differentiation. On the other hand, many mining enterprises were on a small scale, were lacking in private capital, and were short-lived.⁴³ Most decisive was certainly that the state was not only the principal investor, but also the main marketing agent and consumer. Consequently, partly because of the state's interest, domination, and achievements, the question of the Yunnan mines' capitalistic nature cannot be approached merely from the point of view of either the social and economic organization at the grass-root level of the miners's community⁴⁴ or the alleged arbitrary exploitation by the state.

¹Ch'ü T'ung-tsu (1), p. 135; Wang Yeh-chien (1), p. 60; QCWXTK, p. 4983.

²See HBSZL, I, 101-123. Peasants were permitted to pay small amounts of their land taxes, stated in an amount of silver, with copper coins. For example, if a peasant owed 1 unit of silver and in a given year could pay for this with 10 copper coins, the next year due to the drainage of silver and the consequent rising of the exchange rate he would have to pay more. On the rise of the silver value, the general fall in prices, and the rise of the land tax burden on the eve of the Taiping rebellion see Wang Yeh-chien (3), p. 114-115.

³See for instance DQSC:QL, III, 1361 (YZ 13/10/renshen).

⁴King (1), p. 121.

⁵Wang Guangyue (1), p. 100.

⁶For the attempts at monetary reform in the late Qing see King (1), pp. 121, 211-228.

⁷For the organization of mint production and its difficulties see Peng Zeyi (1), pp. 192-200; Peng Zeyi (3), pp. 112-123; Burger (1), pp. 26-33; QCWXTK, p. 4998c.

⁸On the concept that the monetary system is subject to manipulation, expressed in such terms as guan qingzhong ("balancing the heavy and light") and zimu xianqquan ("mutual balance between mother and child"), see Yang Lien-sheng (2), p. 69.

⁹On the necessity of state control of the exchange rate see QCWXTK, p. 4967.

¹⁰Xia Yin, ca. 1700, HCJSWB, IV, 1925.

¹¹See for instance G. Shandong Aligun, QSL:QL, VII, 4785 (QL 13/8).

¹²Dai Zhi (YZ 1/10/25), GZDYZ, I, 899; QCWXTK (YZ 9), p. 5146c.

¹³See Kangxi ba zhi shi'er nian youquan quzhu de yushi zouzhang, p. 22; QSL:QL, VII, 4785 (QL 13/8); HBSLZ, I, 112.

¹⁴See Peng Xinwei (1), p. 627.

¹⁵Wang Yeh-chien (4), pp. 364-65.

¹⁶QSL:QL, VII, 5174 (QL 14/5/dingmao).

¹⁷See HBSLZ, I, 101-123.

¹⁸See, for instance, Tang Youseng in Oct. 1702, quoted by Burger (1), p. 71.

¹⁹For a contrary view see Burger (1), pp. 113 ff., who holds that neither a market economy nor a monetary economy existed in China in the 17th and 18th century and that the Qing emperors never tried to increase the supply of cash or of any other commodity.

²⁰See Twitchett (1), pp. 66-83; Jerome Ch'en (1); Ray Huang (1), pp. 74-79; Liao Bao-seing (1), 15:60-105, 229-273.

²¹See Encyclopedia Americana, VII, 652 ff.

²²Wang Kung-ping (1), p. 10.

²³Zhongguo jindaishi qongyeshi ziliao, pp. 702, 707, 713; Yan Zhongping (1), pp. 45-49.

²⁴Xie Jiarong (1), p. 176; Torgasheff (1), p. 186.

²⁵Wang Kung-ping (1), pp. 17, 141.

²⁶On immigration, population growth, and the regional impact see James Lee (1), (2), (3), (4); Ho Ping-ti (3), pp. 56, 283; QSL:QL, VI, 3908 (QL 11/6/jiawu); GCQXLZ, IV, 2563.

²⁷See GCQXLZ, IV, 2563; QDKY, I, 78, 141; DNKCTL, A:28.

²⁸See Commeaux (1).

²⁹Bottazzi (1); Corradini (1); Silas Hsiu-liang Wu (1); Pei Huang (1), and (2), pp. 302-308; Wang Yeh-chien (3), p. 68.

³⁰See Metzger (4), pp. 27 ff.

³¹ See QCWXTK, pp. 4967c-4968, 4968c. Most documents in the QDDA, pp. 161-209, are principally concerned with minting profits; cash output is only occasionally mentioned.

³² QSL:QL, V, 3312-3315, 3383-3387, 3528-29, 3558, 3636-37 (QL 9/10/renzi, QL 10/1/xinsi, QL 10/6, QL 10/7, and QL 10/10).

³³ See, for instance, G. Jiangxi Wu Wenrong (DG 24/4), HBSZL, I, 103.

³⁴ This also held true for the monetary system in its entirety. Silver was in the hands of private merchants and silver foundries, while copper cash minting was a monopoly of the state. See Metzger (4), p. 44.

³⁵ For an example from the tribute grain system see Metzger (2), p. 40n40.

³⁶ E-tu Zen Sun (6), p. 146; King (1), pp. 142, 143.

³⁷ See, for instance, Jin Shiyang (YZ 2/4*/1), GZDYZ, II, 529; GG. Wudashan (QL 27/6/12), QDKY, I, 141.

³⁸ GG. Zhao Shenzhen (DG 6/1), GCQXLZ, XII, 7015-16; G. Lu Jianying (DG 26/7/13), Lu Wenjie gong zouyi, pp. 17-20; GG. Lin Zexu (DG 27), DaoXianTongGuang sichao zouyi, II, 785 ff.; G. Zhang Liangji (XF 1), QCXWXTK, p. 7980b.

³⁹ On the attempt to revive the Yunnan copper mining industry see King (1), pp. 219-220.

⁴⁰ G. Wu Zhenyu, QSLZ, 42:42b; Yan Zhongping (1), p. 43.

⁴¹ Zhelintang yiji, 2:9.

⁴² For an account see Rocher (1), II, 29-192; Tozzi (1).

⁴³ GG. Bolin (JQ 24/1/25), QDKY, I, 199.

⁴⁴ See Lin Wenzhong gong zhengshu, II, 1233-53, 1615-22; Qiaojia xianzhi, I, 67-72; Malong xianzhi, I, 89; Pu'er fuzhi, 28:26; Zhennan Zhouzhilue, I, 337; Xuxiu Songming Zhouzhi, I, 120-121; Yan Zhongping (1), p. 44.

⁴⁵See Rowe (1), pp. 80-81; Wei Qingyuan (1), pp. 77-79.

⁴⁶Cai Yurong was certainly not an innovator in mining policy. He himself explicitly stated that he was referring to the mining regulations laid down by the central government in 1675 and 1679. See DX, II, 694-96; chap. III, 2, b.

⁴⁷Wei Qingyuan (1), p. 80; id., (2), pp. 2 ff.; id., (3), p. 66.

⁴⁸Ni Tui, HCJSWB, IV, 1896.

⁴⁹For examples of miners being designated as merchants see GCQXLZ, IV, 2563; GCQXLZ XI, 6597; Bao Zuoyong, QDKY, I, 76.

⁵⁰See Ni Tui, HCJSWB, IV, 1896; GG. Yang Yingju, QCWXTK, pp. 5016c-5017.

⁵¹QSL:KX, VI, 3402-03 (KX 52/5/qengchen); see also Gao Qizhuo (YZ 1/12/20), GZDYZ, II, 185.

⁵²Probably the same, or close to, Wang Rixing who undertook silver mining in Zhanyi and Qujing. See G. Gan Guobi (KX 56/6/2), GZDKX, VII, 53.

⁵³See Gao Qizhuo (YZ 1/12/20), Jin Shiyang (YZ 2/41/1), GZDYZ, II, 187, 529.

⁵⁴QDKY, I, 78.

⁵⁵James Lee (2), p. 299.

⁵⁶Elvin (1), pp. 286-89.

⁵⁷Gao Qizhuo, GZDYZ, II, 186.

⁵⁸QSL:QL, III, 1962 (QL 5/11/renshen).

⁵⁹See GG. Bolin (JQ 20/3/21), QDKY, I, 190. A similar statement is also made in QSL:QL, XXIV, 17658 (QL 49/6/qengyin).

⁶⁰QSL:QL, V, 3201 (QL 9/6/jisi).

⁶¹Wei Qingyuan (2), pp. 14-16.

⁶²Metzger (4), pp. 38-46.

⁶³On this see also James Lee (4), pp. 26-27.

**See, for instance, Shang Yue (1), p. 193; Wang Minglun (1), pp. 673 ff.; Balazs (3), pp. 303 ff.

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Curriculum vitae

- 15 June 1954 Born in Basel, Switzerland.
- 1974-1979 Studies in sinology, japanology, and ethnology at the Universities of Freiburg and Berlin, West Germany.
- July 1979 M.A. degree in Berlin.
- 1980-1982 Studies in sinology at the University of Zürich.
- Jan. 1983 Doctoral graduation in Zürich.
- 1983-1985 Grant of the Swiss Foundation for the Promotion of Science for the preparation of a work on the history of the Sichuan salt administration and salt industry. Completed in January 1986.
- Lectures held at the Universities of Zürich and Bern.
- 1983 Research year in Taiwan and Hong Kong; search for material on the history of the Sichuan salt administration in several libraries and archives.
- Feb.-March 1985 Two-months research trip to Harvard's Fairbank Center and Harvard-Yenching Library.
- 1986 Collaborator of the Needham Research Institute; responsible for the completion of section 37 (The Salt Industry) of Science and Civilisation in China. Grant from the Swiss Foundation for the Promotion of Science and the Needham Research Institute.

